gence can be reasonably asked for, on the ground of unavoidable haste, or pressure of other duties.

The volume is showily but not very correctly printed; among other odd mistakes, we find, on page 226, a reference to the "erysipelatous *liver* [probably meant for *livor*] and vesication of the surrounding skin."

J. A., JR.

ART. XXII.—*Second Annual Report of the State Board of Health of Massachusetts.* January, 1871. pp. 433. Boston.

SOME three years ago, the State of Massachusetts concluded that the health of its people was a matter of public concern, and therefore a proper subject for legislation. The idea had begun to prevail that much useful sanitary information could be obtained by a board, acting in a public capacity, and receiving and utilizing the facts and opinions of individual observers. With this end in view, there was established a Board of Health, consisting of seven members, whose business it is to inquire into all matters appertaining to the sanitary condition of the people, and to report thereon to the legislature.

The volume before us bears abundant witness to the wisdom that prompted this movement, and the value of the information elicited. The nature and importance of the work may be partly seen from the mere titles of the papers published. These are: Poisoning by leaden water-pipes; Trichina disease in Massachusetts; Health of towns; Charbon; Causes of typhoid fever; Homes for the poor; Convalescent homes; Sewage; Effects of intoxicating drink, at home and abroad; Analysis of mortality in the city of Boston in 1870; Ventilation of school-houses; Examination of the water of Mystic Pond and its tributaries; Air and its impurities; Health of minors employed in factories; Use of milk from cows affected with "foot and mouth disease." But it is not merely the subjects treated that give to this report its great interest and importance. Every one of the papers is marked by faithful and intelligent investigation, and furnishes suggestions of inestimable value.

There is perhaps no clearer manifestation of the genuine and healthy growth of medical science in our time, than the close and accurate scrutiny now making into the causes and conditions of disease. The age of panaceas and specifics is nearly past. The honest and educated physician is a more modest man than his predecessor of a half-century ago. With less faith in drugs, he has more in Nature. Less confident of his power to thwart the processes of disease, he is more apt to observe, comprehend, and guide them. If he rarely pretends to the power of aborting, jugulating, or arresting acute illness, he certainly is in far less danger of crushing his patient by a blow aimed at the disease. More and more does the intelligent physician regard the causes of disease as the true objective point of his pursuit. More and more fully every year does he realize, practically as well as theoretically, that every malady is the result of some cause or group of causes. And the grand principle that most cases of illness occur as the consequence not of single, but of combined causes, is beginning to be rightly appreciated. To seek these out, to distinguish them into predisposing and exciting, mediate and immediate, essential and accidental, and, above all, into avoidable and unavoidable, this is now the task of the physician. No longer looking on disease as an inscrutable, mysterious affliction, direct from the chastening hand of an angry Deity, but as the reasonable consequence of certain antecedents, known or unknown, he seeks fully to apprehend the number and variety of these causes, in the hope that some may be found preventable. The more thoroughly all conditions of disease are investigated, the more likelihood is there of discovering some one or more morbific influences, which may be capable of removal. Even if such removable causes of disease be less numerous or less efficient than those which are beyond our control, it is still our province to do the little we can to avert suffering. And the more disease is studied, the greater proportion will the avoidable causes bear to the others. Every year new light is thrown on the origin of some form or class of disease; and very often that light shows us where we may lay a helping and healing hand. If to-day a malady be yet an enigma, or its causes, though known, apparently beyond our power to control, to-morrow may remove the veil, or reveal the means of overcoming the morbid tendency.

The volume before us is a noble evidence of the desire among medical men to know and abolish the sources of sickness and death. It is pleasant to observe the spirit and fidelity with which the Massachusetts "Board" has done its work. Here are no mere forms, preliminary to the drawing of salaries. The work is so good and so honest, that, in these days of political corruption, it is difficult to believe that it has been done by the nominees of a State legislature. The expenses reported for the year are only $2300; less than one-half the appropriation. Very properly, however, the Board asks that the appropriation be continued undiminished, to provide for further investigations, and the possibility of unforeseen needs.

The chairman of the Board is Henry I. Bowditch, M.D., one of the most eminent of the elder Boston physicians. Our readers will remember him as directing the attention of the profession, some years ago, to the influence of local climatic causes in the originating and developing of phthisis. The method then adopted in his own investigations—a systematic correspondence with medical men throughout the State—has been most successfully employed in the report before us, in accumulating facts and opinions on matters of sanitary importance. At the request of the Board, the authorities of the different towns have each appointed some prominent resident physician to act as its informant and correspondent. Of course all facts bearing upon the health of the several towns are welcomed; but to provide against possible forgetfulness or negligence, and to obtain facts on certain points which the Board desire to investigate, circulars were sent to all the correspondents, containing a series of questions. This plan has succeeded in eliciting the facts observed and the opinions entertained by some two hundred physicians in as many different towns. These, if not composing the entire State, yet fairly represent all the diversities of climate and local influences to be found within its borders. Towns by the sea, and towns in the mountains; towns by rivers and by ponds; towns built upon the rock, and upon the sands; towns agricultural, fishing, manufacturing, and commercial; from Cape Cod to the mountains west of the Connecticut—all are represented. The reports sent by these correspondents in answer to the letters of inquiry from the Board are generally intelligent and pertinent. When the various replies to any one question are compared together, they often develop facts of great interest and importance. The results of the correspondence, and often the exact words written, are given under different heads, in the dozen essays which compose the volume. The Secretary, Dr. George Derby, whose whole soul seems to be in his work, has, by skilful analysis and arrangement, admirably used the matter provided by his correspondents. Besides this labor, he has visited towns in all parts of the State, consulted with the local Boards of Health, delivered lectures on subjects connected with sanitary science, and thus kept authorities, physicians, and the public well informed as to the existence and objects of the Board.

To illustrate the conscientious manner in which this organization has striven to perform its whole duty, we may note their apology for the non-appearance of an exhaustive report on the effect of sewing-machines upon the health of the operators. Such a work was expected from a prominent physician in a manufacturing city, appointed to make the investigation, but who failed to perform his task.

In the preparation of the various essays before us, the Secretary has, in some cases, done all the work himself, and—whether of mere arrangement, or of generalization and reasoning—has done it well; while in other cases, he has availed himself of the talents of gentlemen eminent in some special line of investigation. The great value of the information given in these papers leads us to wish that all the States might imitate the old Bay State in the appointment of a truly scientific Board of Health.

One of the longest and most elaborate essays is entitled "*An Inquiry into the Causes of Typhoid Fever in Massachusetts.*" This disease is a very common one in New England. Apart from the many lives lost by it, the loss of time by those who recover is of much moment in an economical point of view. Hence the fact here demonstrated, that the prevalence of the disease is influenced by conditions at least partly removable, is of very great importance. The facts collected from different correspondents seem to indicate that there are several antecedents bearing a close connection with the production of this fever, and which are often capable of removal. One apparent cause of the disease is the use of drinking-water contaminated with sewage. That such water has seemed, in many cases, to be the actual exciting cause of the malady, seems to be proved by many remarkable facts. Yet that by itself it always causes the disease, is certainly not true. And, moreover, in other cases, another class of antecedents seem to stand just as clearly in the position of causation. Why in certain cases the use of foul water seems innocuous, while in others every consumer is stricken with the fever, is a curious problem. But certainly the facts collected in this essay, while clearly showing the possible activity of filthy water as a cause of disease, do no less clearly show that it is by no means so surely noxious as is believed by some recent English writers. It would be hard to explain the experience of Boston, upon the view of these observers. For, until twenty years ago, though very closely built, its water-supply was wholly derived from wells in cellars, yards, and streets—and of course exposed to the contaminations so much dreaded. Now, at the time mentioned, an abundant supply was obtained by aqueduct from a pure and distant lake—superseding almost totally the old wells; and causing, too, a vast improvement in habits of cleanliness. Yet there was no such remarkable diminution in the amount of typhoid as should have obtained, were it caused by bad water.

Impure air, and not water, is as strenuously maintained, by some, to be the cause of typhoid. And certainly, that it has in many of the endemics described by correspondents, occupied the place of apparent cause, or essential condition, is indubitable. The precise nature of the impurity liable to cause the malady in question is not known. It seems as though air, loaded with odorous products of decomposition, is less often noxious than that tainted with less perceptible impurities. It is suggested, that possibly the deleterious element may be an earlier product of decay than the offensive gases. Practically, the evidence is overwhelming that the emanations of sewers, and of cellars containing decaying vegetables, are often causes, if not the only or essential cause, of the typhoid or enteric fever.

However we may be puzzled by the singular contradiction apparent in the facts, we fortunately can have no hesitation in drawing the valuable practical inference that this very grave and common disease is largely due to preventable contamination of the air we breathe, and the water we drink. One form of atmospheric impurity sometimes connected with the prevalence of disease, is less preventable, though not wholly beyond our control. We refer to the emanations from newly upturned mould, and from drying ponds or marshes. The reality of the connection between telluric influences and typhoid is shown partly by the greater prevalence of the disease in autumn and early winter, and more positively and strikingly by the relation shown to exist between the character of the subsoil and the prevalence of typhoid in different towns. A clayey or otherwise hard and impenetrable subsoil is found to favour the prevalence of the disease; while an open, porous subsoil is generally associated with a comparative immunity. The writer adverts to the smaller proportion of cases found in the cities as compared to the country towns, as supporting his view of the potency of telluric causes. The close pavements of the former, he thinks, prevent the ascent of the baneful miasm. The curious fact is recognized that the same kind of earthy influences producing typhoid, but never intermittent, in Massachusetts, are the generally accepted causes of the latter disease in the States where it prevails.

The essayist quotes the opinion of Dr. Benjamin Rush, written sixty years ago, supporting the views now presented of the causation and preventability of fever, and prophesying its ultimate control by municipal ordinances.

The report on *Lead-Poisoning from the Use of Leaden Water-pipes* contains nothing of especial novelty or importance. The practical hint, never to use water which has been standing in contact with the metal, deserves to be closely heeded.

The paper on the "*Trichina Disease*" points out thorough cookery as the one sure preventative. The writer does not believe the malady to be a new one, but rather to have been formerly confounded with acute febrile diseases.

The article on the "*Health of Towns*," made up from the answers to queries relative to diseases most prevailing in the different districts, is one of great interest. The effects of occupation, habits of life, soil, sunlight, shade, dampness, and all the other circumstances which affect life and health, are forcibly illustrated or thoughtfully suggested. The researches of Dr. Bowditch, begun years ago, into the influence of local climate upon the prevalence of phthisis, have evidently had their effect in leading the correspondents to look closely and critically at all the traits, natural or artificial, which characterize the climate and influences of their several localities.

The report on "*Charbon*," or malignant vesicle, was prepared in consequence of a few cases arising from time to time among workers in horsehair, in a single town. It is a carefully written account of the disease, with a searching inquiry into its origin, and full directions for destroying the infectious element in suspected hair.

The essay entitled "*Homes for the Poor: Convalescent Homes: The Sewage Question*," is from the pen of Dr. Bowditch. It is made up principally of his own observations of the dwellings of the poor at home and abroad; the influence which these exercise on the health and character of their inhabitants; and the attempts now making in London to benefit the lower classes through improved lodgings. During a recent sojourn of several months in London, he penetrated the worst slums of that city, and became thoroughly conversant with the physical and moral causes of the degradation there existing. He also made himself acquainted with the views, plans, and efforts of the philanthropists who are now seeking to elevate the social condition of the people. His account of what he saw and heard is of thrilling interest, and full of useful suggestions. One great lesson drawn from the experiment of providing good and wholesome dwellings for the London poor is, that better homes make better men. Not only are the beginnings of vice and crime prevented by the influence of decent homes, but even persons already vicious are to a certain extent amenable to the improving agencies of comfort and cleanliness. It does not require extraordinary far-sightedness to predict that before many years society will conclude that it cannot afford to allow the poor to live in filth and squalor. As a merely economic and self-protective measure, it will compel landlords to conform their tenements strictly to the rules of sanitary science, and will rigidly limit the number of tenants to be permitted in a certain space. It is folly for even the most selfish member of the wealthy classes to be regardless of the misery that lies all around him in the great cities. The pestilence which begins among the degraded does not always stop there. The rag-picker may bring contagion to the very door of the rich man. The breath of the wretched beggar craving alms of his lady at her carriage-step, may waft to her the seeds of death. The little wanderer of the street, in brushing past his child, may render vain the anxious care of years. The highly recommended nurse-maid may even carry the infant into scenes and atmospheres that would make him shudder. But even if he and his escape these personal dangers, the heavy taxation needed to support and punish as criminals those who should have been honest workers, and the less direct but indubitably evil influence of misery, vice, and crime upon the general business prosperity of his city, should lead the worldly-wise man to act like the philanthropist.

Convalescent homes in the country, to which poor patients making slow recovery in city hospitals may be transferred to complete their cure, are warmly advocated by Dr. Bowditch. Reminding us of the fact that patients are discharged from all our great hospitals before full restoration has occurred, he shows how often a relapse, or permanent debility, results from the return of such patients to their homes and labours before their strength is regained. Humanity, and, if her mandates be disregarded, true economy, bid us provide places wherein the weakened frame may enjoy the beneficent influence of time, fresh air, change of scene, good food, and generally wholesome surroundings. Several institutions of this character are now in operation in England. The relief they afford is almost incalculable. Any one who has been connected with a large metropolitan hospital, even in this country, where the pressure of new and urgent cases necessitates the hurrying out of patients before they are really strong enough safely to resume work, and where there are always some cases to whose complete recovery fresh country air is an indispensable but unattainable condition, will rejoice to learn that one of the great London hospitals is now provided with a convalescent branch in the country. "Will Massachusetts," Dr. Bowditch asks, "take the lead in this most beneficent of sanitary measures?" Will not some wealthy Philadelphian, actuated by a noble pride and worthy rivalry, hasten to place our own State and city in this proud position?

The question of the disposition to be made of sewage was found by Dr. Bowditch to be exciting great and increasing attention among political economists and sanitary reformers. In its twofold aspect of health and economy, it has even become the great question of the day in England. Let us in America not wait until our exhausted land fails to feed our multiplied millions, before taking effective measures to save and return to the soil the material taken from it and essential to its fertility. Some of the English writers and experimenters believe that the "earth-closet" principle is the one upon which will be solved the double problem. On the scale of single farms, and hospitals, and in several villages of some fifty houses, it has proved a perfect success both in disinfecting and utilizing the sewage. The method seems well worth trying by our farmers and by many others in particular circumstances. Its applicability on a much grander scale is also worthy of full investigation.

One very curious, if not especially valuable, collection of answers, resulted from the question, sent to all the correspondents, "What, in your judgment, has been the effect of the use of intoxicating liquors as a beverage, upon the health and lives of the people of your town?" As may be supposed, the replies are very various; still, out of the one hundred and sixty-four respondents, nearly all admit that a great deal of evil results from such use. Of more value, perhaps, are the responses published to somewhat similar though fuller queries addressed to U. S. consuls all over the world. It was asked what kind of intoxicating drinks were used, and what kind and amount of crime could be attributed to them. Some very curious and interesting facts are published, though not all capable of yielding any general inferences. It seems, however, that little or no crime results in southern countries from the large and universal consumption of their wines. Intoxication here is very rare, and confined to those who use liquors stronger than the native wines. As we go north, we find a greater amount of intoxication and of resulting crime. The liquors consumed are generally much stronger. Quarrels and violence are here the ordinary results of drink, while in southern countries no such effect results even in the rare cases of intemperance. The universality of the craving for stimulants is shown by the letters given from Europe, Asia, Africa, both Americas, and the islands of all the great oceans. One curious fact stated is that in certain parts of Ireland common ether has almost entirely supplanted whiskey as a potation.

The tables presented under the heading of "*Mortality of Boston in* 1870" are of much value, as showing the effects of local conditions upon the death-rate of different parts of the city. They are rendered more significant by the fact that the statistics are collected not according to the wards of the city—which in many cases include regions widely different in all sanitary respects—but according to "health-districts." In dividing the city into these districts, attention was directed solely to securing in each a certain homogeneousness of character. Presented in this form, the figures are startling. Two sets of influences unfavourable to health prevail in varying proportions in different districts. One is the filth, poverty, and unwholesome living of the degraded poor; the other, the noxious miasm, bad drainage, and dampness due to recently and imperfectly filled "made land." The enormous discrepancy between the percentage of mortality in the different districts, and the still greater difference in the proportion of the deaths from cholera infantum, scarlatina, and some other diseases largely dependent on local causes, is very strikingly shown. No more startling exhibition of the dominion exercised by such causes over the prevalence of these diseases could be imagined. The Board brings against the municipal government the grave accusation that it has allowed building to go on and people to reside on land unfit for human habitation; so imperfectly drained and so slightly raised above the sea-level, that untold suffering and death must result, and whole districts ultimately be raised and rebuilt at an enormous cost. Certainly the facts presented wear an ugly aspect. How strange it seems that the authorities of our great cities fail to realize the awful responsibility which rests upon them! How little would they relish municipal banquets, or even municipal pickings, if they could be made to feel their individual accountability for the lost lives of thousands of innocent children!

The two papers on "*Air and some of its Impurities*," and "*The Ventilation of School-houses*," though by different authors, are interesting and profitable if read in connection. The compiler of the first, while distinctly recognizing the fact that carbonic acid gas is not the only, nor perhaps the most noxious, impurity in the air, free or confined, of our large cities, yet regards it as a sufficiently exact index or representative of the sanitary qualities of the particular atmosphere in which it is measured. He caused a series of careful measurements of this gas to be made in the air of various public buildings, schools, college recitation-rooms, offices, streets, and public squares. In the tables of results are carefully noted all the circumstances affecting each experiment. In view of the popular notion, so much insisted on and magnified by certain English savants, that the atmosphere is always loaded with organic germs, a distinguished microscopist was employed to thoroughly examine the air of Boston, with a view to determining the existence of such organisms. He failed to find them, and evidently believes the English observers allowed themselves to be grossly deceived. Certain particles which they supposed came from the air, he shows may have come from the water used to wash it. Certain others, having by their movement the appearance of life, he shows to be entirely inorganic.

The essay on ventilation as applied to school-houses is admirably prepared, and of great practical importance. It is wonderful and most lamentable to see how in this age of general enlightenment we still continue to sacrifice the health and lives of our children, for want of knowing or applying the simplest principles of ventilation. Thousands of children, in this city and in others, have their constitutions impaired, perhaps even ruined for life, by a process of slow poisoning, from the inhalation for several hours daily of air deprived of its due proportion of oxygen, and loaded with carbonic acid and still more deleterious emanations from hundreds of crowded and heated bodies. Too hard and too protracted study has doubtless injured many; but we believe that many more children really owe their failing health to bad air. And, of course, an amount of study which in a fresh, pure atmosphere could be safely borne, might become excessive and injurious if imposed on a brain stupefied by a narcotic poison. Yet how few parents trouble themselves to visit the rooms in which their children pass weary hours, to ascertain whether the place is really fit to live in. Even when they see children growing daily paler and feebler, and are at last forced to take them from school, they rarely suspect that impure air may be the source of trouble; or if they do, they do not exert themselves to prevent the continuance of a state of things which may be causing disease and death among their friends and neighbours. When we are ready to trust to chance for the feeding and clothing of our children, we may consistently trust to the same source for the life-giving oxygen. But until then it is certainly wrong to pay no heed to the proper supply of this food for the lungs. Yet how constantly are school-houses, halls, and court-rooms built either in entire neglect of this need of the human frame, or with an absurd under-estimate of the provision needful, or with a lamentable ignorance of the means by which the desired end may be attained.

The examination of the water of the Mystic River was designed to ascertain the amount and kind of impurity caused by the draining of manufactories of various kinds into running streams. It is somewhat reassuring to drinkers of the Schuylkill water to learn that up to a certain point Nature corrects and removes what would seem at first to be a dangerous pollution. Dilution, and the chemical process of oxidation, are the means whereby noxious matters, up to a certain amount, are rendered harmless. But let us beware of going too far! The amount of decaying matter which the oxygen of running water can make innocuous is limited. Better never approach that limit, lest unhappily we pass it! Unless the streams whence our cities derive their supplies are most jealously watched, and guarded by appropriate legislation, they will become with each year more and more contaminated.

The brief report on *"Hoof-and-mouth Disease"* in cattle seems to prove that the use of milk from cows thus affected may cause not merely intestinal and general disturbance, but a definite disease, not usually severe, characterized by a vesicular eruption on the mucous membrane of the mouth, and, rarely, on the skin, together with febrile action. It is suggested that at times when milk is suspected, its wholesomeness may be insured by boiling.

Having glanced at the contents of this most interesting volume, we have now only to commend the example alike of the State which instituted the Board, and that of the men that compose it. Certainly it is not often that a good idea is better carried out. And if some of the facts in regard to the sanitary condition of the city of Boston are sad and alarming, we can all the more admire the candour of the men who did not allow pride in their noble city to blind their eyes or seal their lips. Even if city governments, with that strange apathy and indifference to duty which characterize them in this time and country—even if these heed not the warnings addressed them, yet the work of the Board, through the influence of physicians and intelligent men and women who learn of its objects and results, will surely affect the public mind ; and at last force even common councilmen to act as if they had both brains and consciences. B. L. R.